National Marine Fisheries Service Endangered Species Act (ESA) Section 7 Consultation Biological Opinion and Magnuson-Stevens Act Essential Fish Habitat Consultation

Action Agencies:	The Bureau of Indian Affairs (BIA) and NOAA's National Marine Fisheries Service (NMFS)
Species/ESU Affected:	Ozette Lake sockeye salmon (*Oncorhynchus nerka*)
Activities Considered:	Funding by BIA of a proposed Hatchery and Genetic Management Plan for Ozette Lake sockeye salmon, and NMFS' determination regarding the proposed HGMP under ESA 4(d) Rule limit 6.
Consultation Conducted by:	The Sustainable Fisheries Division, Northwest Region, NMFS Consultation Number: F/NWR/2000/01489

This document constitutes NMFS' biological opinion for proposed Federal actions that are likely to affect the listed Ozette Lake Sockeye Salmon Evolutionarily Significant Unit (ESU). These Federal actions are funding by the BIA of a Resource Management Plan (RMP) for Ozette Lake sockeye salmon, and NMFS' ESA 4(d) Rule determination regarding the proposed HGMP. NMFS concludes that these actions are not likely to jeopardize the continued existence of Ozette Lake sockeye salmon. NMFS further determines that EFH for Pacific salmon will be adversely affected by the proposed fisheries, and that implementation measures described in the RMP be adopted as the EFH conservation measures.

This Opinion has been prepared in accordance with section 7 of the Endangered Species Act (ESA) of 1973 as amended (16 U.S./C. 1531 et seq). It is based on information provided in the joint Tribal/State RMP submitted to NMFS, NMFS' ESA 4(d) Rule Limit 6 Evaluation and Recommended Determination document prepared for the RMP, published and unpublished scientific information on Ozette Lake sockeye salmon in the action area, and other sources representing the best available scientific information. A complete administrative record of this consultation is on file with Sustainable Fisheries Division, Seattle, Washington.

Approved by: for D. Robert Lohn, Regional Administrator

Date: 7/17/03

Expires on: December 31, 2012

Attachment

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I. Consultation History

This document constitutes NOAA Fisheries' Biological Opinion (Opinion) for proposed Federal actions that are likely to affect the listed Ozette Lake sockeye salmon Evolutionarily Significant Unit (ESU). These Federal actions (described below) are funding by the Bureau of Indian Affairs (BIA) of the Makah Tribe's proposed Hatchery and Genetic Management Plan (HGMP) for Ozette Lake sockeye salmon (hereafter also referred to as a Resource Management Plan (RMP)), and NOAA Fisheries' ESA 4(d) Rule determination regarding the RMP. This Opinion has been prepared in accordance with section 7 of the Endangered Species Act (ESA) of 1973 as amended (16 U.S.C. 1531 et seq). It is based on information provided in a joint tribal/state RMP (Makah 2000) prepared under NOAA Fisheries' ESA section 4(d) Rule for threatened salmonids (50 CFR 223.203), NOAA Fisheries' ESA 4(d) Rule Limit 6 Evaluation and Recommended Determination document prepared for the RMP (NOAA Fisheries 2001), published and unpublished scientific information on Ozette Lake sockeye salmon in the action area, and other sources of information. A complete administrative record of this consultation is on file with NOAA Fisheries Sustainable Fisheries Division, Seattle, Washington.

NOAA Fisheries' ESA section 4(d) Rule for 14 threatened salmonid ESUs contains a "joint resource management plan" limit that provides that the prohibitions of section 9(a)(1) of the ESA do not apply to resource management plans that meet the requirements of that limit (50 CFR 223.203(b)(6). The Makah Tribe, and the Washington Department of Fish and Wildlife (WDFW) as the resource co-manager, first submitted a joint RMP in October, 2000, before the take prohibitions were in place for the listed Ozette Lake sockeye salmon ESU. After the take prohibitions took effect in January, 2001, the Makah Tribe and WDFW (hereafter referred to as the co-managers) requested that the joint RMP be considered under the 4(d) Rule. The RMP will affect the threatened Ozette Lake sockeye salmon ESU in the State of Washington.

NOAA Fisheries has determined that the RMP meets 4(d) Rule limit requirements for joint resource management plans. Its evaluation and recommended determination document is appended as Attachment 1.

Because the BIA provides funding for the artificial propagation, research, monitoring, and evaluation actions implemented through the RMP, it requested initiation of formal ESA section 7 consultation on June 26, 2000, on the effects of its funding of this RMP on the Ozette Lake sockeye salmon ESU (Speaks 2000). NOAA Fisheries is consulting with itself under section 7 due on the Federal action of rendering a determination regarding whether or not the proposed joint RMP addresses ESA 4(d) Rule Limit 6 criteria, and so whether limitations on the application of section 9 take prohibitions are warranted.

II. Proposed Action and Action Area

The programs described in the RMP are funded by BIA (a Federal agency) and conducted by the Makah Tribe, a Federally recognized tribe with treaty fishing rights in western Washington State.

WDFW is also involved in the implementation of the RMP as fisheries resource co-manager, with the Makah Tribe, under *United States* v. *Washington*.

Following *Endangered Species Act Consultation Handbook* guidelines (USFWS and NOAA Fisheries 1998), the hatchery, research, and monitoring and evaluation activities implemented under the RMP are considered likely to adversely affect listed Ozette Lake sockeye salmon. The activities include: (1) collection and removal of up to 200 natural and hatchery-origin adult sockeye salmon from an Ozette Lake tributary (Umbrella Creek) for use as hatchery broodstock; (2) collection of up to 10 beach spawning sockeye salmon adults for use in egg to fry survival research; (3) capture, handling, tagging and release of adult sockeye salmon for migration and pre-spawning survival research in Ozette Lake; (4) observation and biological sampling of adult sockeye during spawning ground surveys in beach and tributary areas; (5) juvenile sockeye salmon out-migrant trapping; and (6) egg to fry survival rate studies. Such activities will involve harassing, capturing, trapping, handling, killing, tagging, marking, or holding fish. Adult and juvenile sockeye salmon will be captured using weirs, traps (inclined plane-type and fyke net), beach seines, and gill nets. Tissue and scale samples will be collected from live fish and fish carcasses for genetic analysis. The RMP provides full details regarding proposed methodologies, and expected impacts. The RMP also summarizes the type and level of take anticipated. NOAA Fisheries' evaluation of the RMP for its compliance with ESA 4(d) Rule Limit 6 criteria provides further discussion of the RMP implementation activities (NOAA Fisheries 2001).

Sockeye salmon adults returning to Umbrella Creek are the result of past hatchery releases, as natural-origin sockeye salmon have been absent from Ozette Lake tributaries in recent decades. Adult fish are collected for use as broodstock for the tributary hatchery program across the breadth of the total natural and hatchery-origin adult return. Broodstock collection from the tributary is limited to 200 adult fish annually. The progeny of these adult fish, approximately 215,000 unfed and fed sockeye salmon fry, will be released at two locations (Umbrella Creek and Big River) each year, resulting in an estimated average annual return of 1,278 adult fish. The hatchery program implemented through the RMP may assist in establishment of self-sustaining, naturally spawning aggregations in the tributaries. All hatchery sockeye salmon will be otolith marked, and a sufficient number of juvenile sockeye produced will also receive a fin clip mark, to allow for program performance monitoring. The duration of the tributary hatchery program is limited to 12 years, predicated on the successful re-establishment of each of the four year sockeye salmon classes required to provide viable, naturally-spawning, fully-seeded aggregations in the release areas. If the program is successful in establishing self-sustaining sockeye runs that meet determined escapement goals for release areas after 12 years of operation, it will be terminated. If the program, or a specific element of the program is determined to not be effective, it will be terminated. If, after 12 years, the program is meeting performance standards, and is expected to, but has not yet fully accomplished program goals, continuation of specific components of the program will be proposed and reevaluated. Similarly, if aspects of the program are not meeting goals or standards, but alternative adaptive management measures are available that are likely to achieve goals and standards providing a net benefit to the ESU, program elements may be changed and continued upon evaluation and reassessment before or after the 12-year evaluation. The co-managers' overall goals and objectives for the program will also be reevaluated over the

duration of the hatchery programs to incorporate new findings. A comprehensive monitoring and evaluation plan will assess the performance of the program in increasing adult fish returns, and the genetic and ecological effects of the program on the listed beach spawning sockeye salmon population. This information will be used to assess whether the performance of the tributary fry release program, and impacts to listed sockeye salmon, are as expected. Review of the RMP will occur annually to evaluate whether the objectives of the RMP are being accomplished.

The action area for this consultation is the geographical boundary of the Ozette Lake sockeye salmon ESU (64 FR 14528, March 25, 1999) in the State of Washington (Figure 1). The Ozette River, Ozette Lake, and tributaries of Ozette Lake accessible to anadromous salmonids are included in the action area. The specific areas for each RMP activity are defined in the RMP and summarized in the NOAA Fisheries evaluation and recommended determination document (Attachment 1).

III. Status of the Species and Critical Habitat

The NOAA Fisheries 4(d) Rule evaluation and recommended determination document (NOAA Fisheries 2001) contains currently available information about the status of the Ozette Lake sockeye salmon ESU. The RMP (Makah 2000), NOAA Fisheries' sockeye salmon status review document (Gustafson *et al.* 1997), and the NOAA Fisheries sockeye status review update document (NOAA Fisheries 1998), were the sources of population status data summarized in NOAA Fisheries (2001) for the listed ESU. Based on these latter sources, the ESU appears to be stable in abundance status, and slightly increasing in recent years.

An updated NOAA Fisheries analysis of Ozette Lake sockeye salmon abundance trends indicates that the long term (1977-98) population abundance trend for Ozette Lake sockeye declined, at an average of -2.0% annually (NOAA Fisheries 1998). The updated analysis also indicated that the most recent ten year (1989-98) trend has changed from a decline of 9.9% per year (as reported by Gustafson *et al.* 1997) to an increase of 2% per year (NOAA Fisheries 1998). The current tributary-based hatchery program described in the RMP was planned and initiated in response to the long term, declining population trends identified for the Ozette Lake sockeye salmon population. Recent re-calculation of past run size estimates by the Makah Tribe, based on complete sets of hard data from camera and visual weir counts, also suggests (as per NOAA Fisheries 1998) a stable or increasing trend in recent escapements to the lake (Makah 2000). From the NOAA Fisheries VSP document, a spawner to spawner ratio of greater than 1 to 1, as may be indicated by slightly increasing abundance trend for Ozette Lake sockeye salmon, is one criteria necessary for population viability (McElhany *et al.* 2000).

The 1977-99 average annual abundance level for the total Ozette Lake sockeye return was 1,075 (range 263 to 2,191; excludes1981, 1985, and 1987 due to lack of data). The most recent 4 year annual mean run size from 1996 to 1999 for this predominately four-year-old age at return population was 1,598 adults (range 1,133 to 2,076; Makah 2000). This most recent 4 year mean escapement average compares to a mean escapement of 811 for the 4 previous years of the cycle

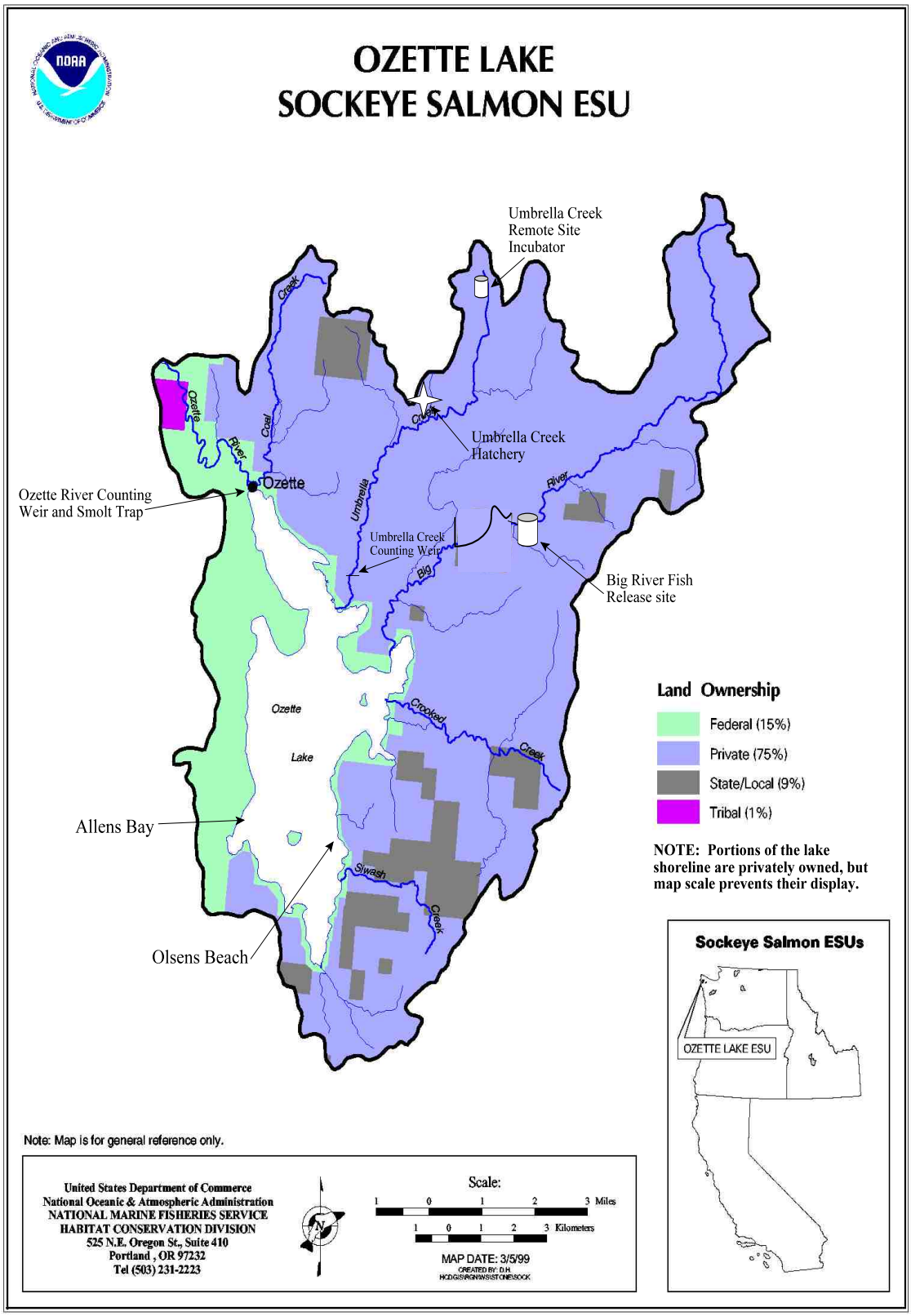

Figure 2. Location and geographic boundaries of the Ozette Lake Sockeye Salmon ESU.

(1992-1995, range ≤267 to 2,548). The 1996-99 mean lake escapements for beach-origin and tributary-origin sockeye were 1,424 and 156, respectively. Sockeye salmon originating from Ozette Lake tributaries (F1 hatchery and/or NORs) comprised an average of 9.8 % of the total escapement in recent years.

Critical habitat for the Ozette Lake sockeye salmon ESU was designated on February 16, 2000 (65 FR 7764). However, a Federal court vacated this rule designating critical habitat for the sockeye salmon ESU considered in this Opinion. The analysis and conclusions regarding critical habitat remain informative for NOAA Fisheries' application of the jeopardy standard. Also, if critical habitat is re-designated before this action is fully implemented, the analysis will be relevant when determining whether a reinitiation of consultation will be necessary at that time.

The actions described in the RMP will occur within the geographic range of the Ozette Lake sockeye salmon ESU. Within this range, Ozette Lake and the Ozette River provide essential spawning, rearing, and migratory habitat for both adult and juvenile life stages of listed, beach-spawning Ozette Lake sockeye salmon. Habitat for natural and hatchery-origin sockeye salmon produced through the hatchery program described in the RMP includes Ozette Lake tributaries. Natural-origin sockeye produced in the tributaries as a result of naturally spawning, hatchery-origin sockeye salmon adults are listed (65 FR 14528, March 25, 1999). Essential features of the adult spawning, juvenile rearing, and adult and juvenile migratory habitat for the species are: 1) substrate; 2) water quality; 3) water quantity; 4) water temperature; 5) water velocity; 6) cover/shelter; 7) food (juvenile only); 8) riparian vegetation; 9) space; and 10) safe passage conditions (50 CFR 226). The RMP does not propose to conduct activities that will disrupt habitat. When implemented, the proposed RMP is not expected to affect any of essential habitat features for the listed sockeye salmon ESU.

IV. Environmental Baseline

The environmental baseline is an analysis of the effects of past and present human and natural factors leading to the current status of the species or its habitat and ecosystem within the action area. The action area is defined as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action" (50 CFR 402.02). The action area for the Federal action that is the subject of this consultation is the Ozette River, Ozette Lake, and Ozette Lake tributaries accessible to anadromous salmonids in Clallam County, Washington State.

The biological requirements for Ozette Lake sockeye salmon are currently not being met under the environmental baseline. The status of the sockeye salmon ESU is such that there must be significant improvements in the environmental conditions of the ESU's baseline.

As noted in NOAA Fisheries' sockeye salmon status review (Gustafson *et al.* 1997), and in the Federal Register Notice announcing the ESA listing of the Ozette Lake sockeye salmon ESU (64 FR 14528, March 25, 1999), habitat in the Ozette Lake watershed is considered degraded. Land

use on private and state lands in the watershed is principally devoted to forest practices. Outside of that portion of the Ozette Lake Basin that is included in the Olympic National Park, virtually the entire watershed has been logged. Among the changes attributable to past forest practices (including intensive logging and associated road building in the watershed prior to state regulation of forest practices) is degradation through siltation of key streams, tributary outwash fans, and beach areas historically used by sockeye salmon. The increased sediment load in the tributaries, with settling of much of the finer sediment in the lake, likely limited what was a more widespread sockeye salmon spawning distribution in the lake and the tributaries to a few, less affected beach areas on the south end of Ozette Lake (WDFW and WWTIT 1994). Dlugokenski *et al.* (1981) suspected that logging-induced sedimentation led to decreased hatching success of sockeye salmon in the tributary creeks and creek outwash fans in Ozette Lake. Sedimentation of key portions of lake tributaries, spawning beaches, and outwash fans as a result of timber harvest and road building may not have caused the declining sockeye salmon abundance, but has contributed to the failure of Ozette Lake sockeye salmon populations to rebuild since the cessation of commercial sockeye salmon harvests in the region in 1974 (64 FR 14528, March 25, 1999). In addition to increased sediment loads, past forest practices in the major Ozette Lake tributaries that also contributed to channel instability (as indicated by stream widening and shallowing), cementing of spawning gravels, loss of pools, bank erosion, and high water temperatures have likely limited sockeye salmon productivity (WDF and WWTIT 1994). Wood removal from the Ozette River and Ozette Lake tributaries may have affected lake level fluctuation rates and may have contributed to sediment deposition on lake spawning beaches, further compounding the loss of quality and quantity of beach-origin sockeye spawning and incubation habitat. Improvement in habitat conditions is essential for successful recovery of Ozette Lake sockeye salmon abundance in lake and tributary production areas.

Potential over-harvest in fisheries that may have occurred in the early and middle 1900s has been identified as a potential reason for the decline of Ozette Lake sockeye salmon from historic abundance levels. Commercial sockeye salmon harvests in the region were terminated in 1974, and no Ozette Lake sockeye salmon fisheries harvest of any kind has occurred since 1982. Harvest in fisheries is not a factor affecting the current ability of the listed sockeye salmon ESU to recover.

Consistent, annual sockeye salmon artificial propagation programs using indigenous origin fish have operated in the Ozette Lake Basin since 1983. Hatchery-origin sockeye salmon releases prior to 1983 involved single, large plantings of out-of-basin-origin (e.g., Quinault River stock) sockeye salmon juveniles. It is unlikely that these practices resulted in the loss of genetic fitness and unique adaptations of the historic Ozette Lake sockeye salmon population (64 FR 14528, March 25, 1999). Current (post-1983) artificial propagation programs have out-planted only native sockeye salmon stock, and are conducted in a manner that will not likely result in the loss of genetic characteristics or adaptive traits to the listed sockeye salmon population.

V. Analysis of Effects

A. Effects of Proposed Actions on Species and on Critical Habitat

In its biological opinions, NOAA Fisheries analyzes the effects of the action as defined in 50 CFR 402.02. NOAA Fisheries considers the estimated level of injury or mortality attributable to the collective effects of the action and any cumulative effects. NOAA Fisheries also evaluates whether the action directly or indirectly is likely to destroy or adversely modify the listed species' critical habitat.

The first step in NOAA Fisheries' analysis of the action's effects on listed Ozette Lake sockeye salmon is to define the species' biological requirements that are most relevant to the consultation. NOAA Fisheries also considers the current status of the listed sockeye salmon ESU, taking into account population size, trends, distribution and genetic diversity. To assess the current status of Ozette Lake sockeye salmon, NOAA Fisheries starts with the determinations made in its decision to list Ozette Lake sockeye salmon, and initially designate critical habitat for ESA protection. NOAA Fisheries also considers new data available that is relevant to the determination.

The relevant biological requirements are those necessary for Ozette Lake sockeye salmon to survive and recover to viable, naturally reproducing population levels, at which time protection under the ESA would become unnecessary. Adequate population levels must safeguard the genetic diversity of the listed stock, enhance their capacity to adapt to various environmental conditions, and allow them to become self-sustaining in the natural environment.

For this consultation, the concepts of viable and critical thresholds as defined in the NOAA Fisheries Viable Salmonid Population (VSP) document (McElhany *et al.* 2000) are applied. Application of these VSP concepts is needed to adequately limit takes of listed sockeye salmon to specified population thresholds or circumstances for the protection of the species. Listed salmonids may be purposefully taken for broodstock purposes only if the donor population is currently at or above the viable threshold and the collection will not impair its function; if the donor population is not currently viable but the sole objective is to enhance the propagation or survival of the listed ESU; or if the donor population is shown with a high degree of confidence to be above critical threshold although not yet functioning at viable levels, and the collection will not appreciably slow attainment of viable status for that population (65 FR 42422, July 10, 2000). Appendix A summarizes the amount and description of known take occurring as a result of the implementation of the RMP.

The tributary hatchery program proposed in the RMP and summarized in NOAA Fisheries (2001) involves the capture, handling and spawning of sockeye salmon returning to Umbrella Creek. Sockeye salmon juveniles produced from adult sockeye salmon broodstock collected for the tributary hatchery program are not listed (64 FR 14528, March 25, 1999). The core, listed beach-spawning sockeye salmon population is not targeted or affected by the broodstock collection program. Egg to fry survival research implemented through the RMP to assess incubation conditions of Ozette Lake spawning beaches will involve the collection of up to 10

beach-spawning sockeye salmon adults each year. The remaining programs implemented under the RMP involve research, monitoring, and evaluation actions that are not intended to kill listed fish. However, capture, handling, sampling, and tagging associated with research, monitoring, and evaluation do have the potential to cause stress, disease, injury or other sub-lethal effects. Makah Tribal Fisheries personnel will use techniques generally accepted in their profession (e.g., trap designs and operational methods, fish handling techniques, anesthetics) when using traps or other fish capture devices, and when fin-clipping, tagging and biologically sampling juvenile and adult sockeye salmon. To reduce risks to listed fish, the Makah Tribe follows established state and Federal guidelines, including fish health policies, during all phases of the artificial propagation program. Based on extensive, prior experience with the techniques proposed for use, and risk minimization and mitigation measures applied (see Makah 2000), the unintentional mortality of listed fish is likely to be very low.

Projected annual sockeye salmon broodstock removal levels for those portions of the RMP involving artificial propagation are: (1) up to 200 natural and unlisted hatchery-origin adults trapped in Umbrella Creek to provide gametes for the tributary supplementation program; and (2) 10 natural-origin, listed adult sockeye salmon removed from Ozette Lake spawning beaches to produce approximately 12,000 eyed eggs for egg and fry survival research purposes.

Takes resulting in the removal for artificial propagation of listed sockeye salmon adults from the natural environment are limited to the tributary broodstock collection program (NOR fish only), and the study addressing beach-spawned egg and fry survival. The actual numbers of adults returning each year to the Ozette Lake sockeye salmon ESU will be substantially higher than total numbers proposed for take through these actions. The tributary broodstock program is focused on hatchery-origin sockeye salmon returns, and will not lead to the take of adult fish from the core, listed lake spawning population. Maximum broodstock removals from Umbrella Creek will be limited after the 2003 return year to 15% of the total annual adult return to the tributary, or 200 adults (100 pairs), whichever is lower. The number of naturally spawning sockeye salmon in the tributaries is enhanced through the program, with potential benefits to recovery of the ESU. Monitoring programs are implemented to insure that injury and mortality rates for adult sockeye salmon collected as broodstock are minimized, and that egg to release survival rates for sockeye salmon progeny brought into the hatchery are maximized.

Listed sockeye salmon removals from the spawning beaches are confined to 10 fish per year, or 0.7% of the recent year (1996-99) average estimated lake spawning population escapement of 1,424. Tributary-origin sockeye salmon may be used instead of listed beach-spawning sockeye salmon for this research, as a measure to further limit effects on the core listed population. Progeny of the 10 beach-origin adult sockeye salmon (if collected for the study) would be transferred as eyed eggs to their beach of origin for containment and incubation in small, removable incubators. Surviving eggs and fry (estimated to be approximately 10% of the total number initially incubated) would be removed from the beaches at the end of the study to assess survival rates. Neither the tributary supplementation or beach survival research programs involving artificial propagation of sockeye salmon are likely to appreciably reduce the survival

and recovery of the Ozette Lake sockeye salmon ESU as a result of demographic reduction effects.

In the RMP, the Makah Tribe proposed adequate measures to reduce risks of injury and mortality to listed fish as a result of the tributary hatchery program. The risk of adverse genetic effects to listed beach-spawning sockeye is adequately minimized by avoiding use of beach spawning fish as broodstock, imprinting hatchery fish to the tributary release locations to minimize straying, and mass marking hatchery fish to allow for effective stray rate monitoring. Measures implemented to minimize disease transfer effects on listed natural-origin sockeye, and to the propagated sockeye populations, are described. Infectious hematopoietic necrosis virus (IHN) is a ubiquitous fish pathogen affecting many west coast sockeye salmon populations. The RMP acknowledges the importance of screening adult and juvenile sockeye salmon used in the hatchery programs for this pathogen, and in reducing the risk of fish disease amplification. Disease monitoring and control protocols in the RMP comply with the "Salmonid Disease Control Policy of the Fisheries Co-managers of Washington State" (NWIFC and WDFW 1998). Fish health monitoring, fish disease control, and hatchery sanitation practices are applied under the direction of fish pathologists to limit disease risks. In its evaluation and recommended determination document, NOAA Fisheries has identified general and specific implementation measures of the RMP that are designed to protect the listed sockeye population (NOAA Fisheries 2001).

Juvenile sockeye salmon released through the RMP hatchery program may compete for food and space with listed beach-origin sockeye salmon during rearing in Ozette Lake. Hatchery sockeye production through the RMP is limited to 80,000 fed fry for release into Umbrella Creek and (assuming a 97% survival rate for 140,000 eyed eggs incubated and reared to the emigrating fry) 135,800 fry at the Big River site. The total release of approximately 216,000 tributary program-origin sockeye fry ranging in size from 0.15 to 1.0 grams (approximately 173 kg total biomass) is a modest release level for seeding a lake the size of Ozette Lake (the third largest lake in Washington State, with an area of 29.5 km^2). Given the size of the lake rearing area available, the apparent high sockeye salmon productivity (Beauchamp *et al.* 1995, and see NOAA Fisheries 2001), the low abundance status of beach spawning sockeye fry populations, and the modest annual hatchery production levels proposed through the RMP, the release of tributary-origin fry is unlikely to overwhelm available food resources in Ozette Lake, and is unlikely to pose substantial competition risks to natural-origin listed sockeye juveniles.

The release of fry only complies with conservation hatchery protocols which call for the production of hatchery fish of the same life stage as natural-origin species that they may encounter to limit competitive effects (NOAA Fisheries 1999). The likelihood of hatchery-origin fish dominating wild individuals in competitive encounters will be reduced if they are of similar size (NOAA Fisheries 1999). Due to similar fish size and non-piscivorous life history characteristics of co-emigrating juvenile hatchery and natural-origin sockeye salmon, predation by hatchery sockeye is not a risk factor for natural-origin fish (SIWG 1984).

Proposed annual research, monitoring, and evaluation programs are projected to affect the sockeye salmon population as follows (by numbers of fish and type of effect):

(1) 200 sockeye salmon adults from the run at large in the Ozette River captured, handled, externally or internally tagged and released for a lake migration, spawning behavior, and pre-spawning survival survey in Ozette Lake in 2003 (and subsequent years if identified as needed for recovery planning purposes). Of the total number of adult sockeye salmon handled, 20 may be injured, and 10 fish may be unintentionally killed;
(2) spawning, fertilization, and incubation of 12,000 beach spawner-origin eyed eggs (progeny of 10 adults above) planted in egg baskets or incubators on Ozette Lake spawning beaches. Beach spawner survival research will involve sacrificing all of the surviving eggs or fry incubated on the beaches (estimated at 10% of the total planted) after a period of time to examine development and mortality rates;
(3) up to 1,000 natural-origin fry captured, handled and released in a sockeye fry predation assessment study in the lake directed at piscine predators. Of the total fry handled, 20 may be injured and 20 may be unintentionally killed;
(4) 10,000 tributary-origin fry captured, handled, and released in a fyke net study of tributary sockeye spawner productivity in Umbrella Creek. Of the 10,000 fish captured, 400 may be injured, and 300 may be unintentionally killed; and
(5) 5,000 to 10,000 (dependent on the annual total emigrating population size) lake and tributary-origin smolts captured, handled, biologically sampled, and released through an upper Ozette River juvenile out-migrant study. Of the total number of smolts captured over this range, 250 may be incidentally injured and 150 may be unintentionally killed.

Other monitoring and evaluation actions conducted under the RMP will not lead to physical contact with live listed sockeye salmon. Habitat and spawning ground surveys may lead to the temporary disturbance of spawners during foot, scuba, snorkel, or boat spawner surveys and carcass and mark recovery projects. Approximately 200 sockeye salmon carcasses may be sampled annually for otoliths, scales, genetic stock identification, and other biological information during spawner surveys, broodstock collection, and through routine monitoring and evaluation activities.

Research activities implemented under the RMP involve capture, handling and release only, and will not lead to the removal of listed adult or juvenile sockeye salmon from the natural environment. Projected incidental sockeye salmon injury and mortality rates resulting from adult sockeye predation and tagging research, and juvenile sockeye trapping programs are low relative to total adult and juvenile sockeye salmon population estimates. The estimated injuries and losses will be spread between listed and unlisted sockeye salmon at proportions to be determined through marked fish recovery analyses (all hatchery-origin sockeye salmon are otolith marked). From the above estimated take levels, RMP research actions may lead to the unintentional loss of a total of 10 natural beach or tributary-origin, or direct (F1) hatchery-origin, adult sockeye salmon. Assuming the 1996-99 average total run size to Ozette Lake of 1,598 (Makah 2000), 0.6% of the listed and unlisted adult sockeye salmon return may be killed. Up to a total of 320 natural or hatchery-origin fry and 150 smolts may also be unintentionally killed through these studies. Assuming a fry to adult survival rate of 0.6% (Makah 2000) and a smolt to adult

survival rate of 10% (Roos, 1991), approximately 17 adult sockeye salmon equivalents may be lost as a result of the research, or 1.06% of the total sockeye salmon population, assuming the recent year average listed and unlisted return. The total estimated listed and unlisted adult sockeye salmon mortality rate resulting from the research is 1.66% of the sockeye salmon population escaping to Ozette Lake each year. Operational measures designed to minimize the potential for injury and mortality of listed sockeye through the research actions are implemented through the RMP.

Research, monitoring, and evaluation have not been identified as factors for decline of the Ozette Lake sockeye salmon ESU, and are generally considered an essential part of salmon and steelhead recovery efforts (NRC 1996). For these programs, the co-managers worked with NOAA Fisheries and cooperating agencies to develop projects which will benefit the conservation and recovery of the species. The projects will provide information that will enhance the ability to make more effective and responsible decisions to aid listed sockeye salmon. The resulting data will enhance knowledge about Ozette Lake sockeye salmon life history, specific biological requirements, genetic make-up, migration timing, responses to anthropogenic impacts and survival in various parts of the ESU's range. This information will also benefit scientific understanding of sockeye salmon productivity in Ozette Lake, and of factors limiting sockeye abundance and productivity. The results of the research are essential for use by NOAA Fisheries' Puget Sound/Washington Coast Technical Recovery Team in making determinations regarding listed sockeye salmon recovery needs.

The actual numbers of adult fish returning each year to the Ozette Lake sockeye salmon ESU will be substantially higher than total numbers proposed for research related take by an order of magnitude or more. It is realistic to expect a similar relationship between juvenile fish abundances and projected take levels occurring through implementation of the RMP as well. Actual fish mortalities resulting from the research programs are expected to be a small fraction of the total research take (handling and lethal take) for both adults and juveniles. Also, the research activities are distributed throughout the Ozette Lake sockeye salmon ESU's freshwater range, thereby further diminishing the impacts of any take on a single critical life stage or habitat. For these reasons, take related to monitoring, evaluation, and research, are not expected to reduce the Ozette Lake sockeye salmon population, their reproductive capacity or distribution to the point of appreciably reducing their ability to survive and recover in the wild.

Artificial propagation activities associated with the tributary hatchery programs rely on low impact, gravity feed water supplies. Water use is non-consumptive and water used to hold and rear fish is returned to the tributaries near the point of withdrawal. The hatchery incubation and rearing sites on the tributaries are small in size, and employ temporary, removable structures and rearing vessels. The sites have a low impact on critical habitat, with little if any habitat alteration associated with their construction and maintenance. Research, monitoring, and evaluation activities involve only transitory habitat alteration effects, such as installing a temporary seasonal weir and an inclined plane trap in the Ozette River (e.g., cabling the weir or trap to adjacent trees and rocks) or conducting foot or boat surveys to count spawning salmon or sample carcasses for biological data. Therefore, NOAA Fisheries concludes that the programs implemented in the

RMPs will not directly or indirectly destroy or adversely modify any of the affected ESU's critical habitat.

B. Cumulative Effects

Cumulative effects are those effects of future state, Tribal, local or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation." The action area for this consultation is the previously described Ozette Lake watershed.

Timber harvest activities are the primary non-Federal actions that are reasonably certain to occur in the future on non-Federal lands in the Ozette Lake watershed. Compliance with forest practice regulations adopted and implemented by the Washington Forest Practices Board, and with regulatory elements of the Forest and Fish Report dated April 29, 1999, and submitted to the Forest Practices Board, are expected to reduce the future effects of timber harvest actions on listed sockeye salmon. Monitoring actions and protective regulations applied by the Washington Department of Natural Resources to timber harvest activities on non-Federal lands in the Basin should also act to minimize the risk of adverse effects on listed sockeye salmon.

VI. Conclusion

Based on the foregoing analysis, including the evaluation of the artificial propagation and research, monitoring, and evaluation actions implemented through the RMP in NOAA Fisheries ESA 4(d) Rule evaluation and recommended determination document (NOAA Fisheries 2001), NOAA Fisheries concludes that the proposed Federal actions are not likely to jeopardize the continued existence of Ozette Lake sockeye salmon ESU.

VII. Incidental Take Statement

With NOAA Fisheries approval of the RMP, ESA take prohibitions will not apply to activities conducted pursuant to the RMP. Therefore, any federal action associated with the fishery harvest activities described in the RMP and the Evaluation/Recommended Determination document also will not be subject to take prohibitions. No incidental take statement has been prepared.

VIII. Conservation Recommendations

Section 7(a)(1) of the ESA directs Federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of threatened and endangered species. Conservation recommendations are discretionary measures suggested to minimize or avoid adverse effects of a proposed action on listed species, to minimize or avoid adverse modification of critical habitat, or to develop additional information.

NOAA Fisheries has no additional conservation recommendations regarding the actions addressed in this Opinion.

IX. Reinitiation of Consultation

Reinitiation of consultation is required if: (1) the action is modified in a way that causes an effect on the listed species that was not previously considered in this Opinion; (2) new information or project monitoring reveals effects of the action that may affect the listed species in a way not previously considered; or, (3) a new species is listed or critical habitat is designated that may be affected by the action (50 CFR 402.16). The action agencies must reinitiate consultation on these actions if new information becomes available, or if circumstances occur that may affect listed species or their designated critical habitats in a manner or to an extent not previously considered. In particular, consultation must be reinitiated if the determination is made by BIA and the co-managers to pursue supplementation of the beach spawning sockeye salmon population for purposes other than research.

X. Magnuson-Stevens Act Essential Fish Habitat Consultation

"Essential fish habitat" (EFH) is defined in section 3 of the Magnuson-Stevens Act (ESA) as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." NOAA Fisheries interprets EFH to include aquatic areas and their associated physical, chemical and biological properties used by fish that are necessary to support a sustainable fishery and the contribution of the managed species to a healthy ecosystem.

The ESA and its implementing regulations at 50 CFR 600.920 require a Federal agency to consult with NOAA Fisheries before it authorizes, funds or carries out any action that may adversely effect EFH. The purpose of consultation is to develop a conservation recommendation(s) that addresses all reasonably foreseeable adverse effects to EFH. Further, the action agency must provide a detailed, written response NOAA Fisheries within 30 days after receiving an EFH conservation recommendation. The response must include measures proposed by the agency to avoid, minimize, mitigate, or offset the impact of the activity on EFH. If the response is inconsistent with NOAA Fisheries' conservation recommendation the agency must explain its reasons for not following the recommendations.

Thus, one of the objectives of this consultation is to determine whether the proposed Federal actions — BIA's funding of the implementation of the Ozette Lake sockeye salmon RMP, and NOAA Fisheries ESA 4(d) determination regarding the RMP — are likely to adversely affect EFH. If the proposed actions are likely to adversely affect EFH, conservation recommendations will be provided.

A. Identification of Essential Fish Habitat

The Pacific Fishery Management Council (PFMC) is one of eight Regional Fishery Management Councils established under the Magnuson-Stevens Act. The PFMC develops and carries out fisheries management plans for Pacific coast groundfish, coastal pelagic species, and salmon off the coasts of Washington, Oregon and California. Pursuant to the ESA, the PFMC has designated freshwater and marine EFH for chinook and coho salmon (PFMC 1999). For the purposes of this consultation, freshwater EFH for salmon in the action area includes all streams, lakes, ponds, wetlands, and other water bodies currently or historically accessible to Pacific salmon. Marine EFH for Pacific salmon in Oregon and Washington includes all estuaries, nearshore and marine waters within the western boundary of the U.S. Exclusive Economic Zone (EEZ), which extends 200 miles offshore.

B. Proposed Action and Action Area

For this EFH consultation, the proposed action and action area are as described in detail above. The actions are: (1) Federal funding through BIA of artificial propagation, research, monitoring, and evaluation actions implemented under a joint RMP by the Makah Tribe, with WDFW; and (2) NOAA Fisheries' ESA 4(d) Limit 6 determination regarding the RMP. The proposed action area is the geographical boundary of the listed Ozette Lake sockeye salmon ESU and is part of

the EFH for chinook salmon. A more detailed description and identification of EFH for salmon is found in Appendix A to Amendment 14 to the Pacific Coast Salmon Plan (PFMC 1999). Assessment of the impacts on these species' EFH from the above proposed actions is based on this information.

C. Effects of the Proposed Actions

Based on information submitted in the RMP (Makah 2000), findings presented in NOAA Fisheries' evaluation and recommended determination document (NOAA Fisheries 2001), and NOAA Fisheries' analysis in the ESA consultation above, NOAA Fisheries believes that the effects of the actions on EFH are likely to be within the range of effects considered in the ESA portion of this consultation.

D. Conclusion

Using the best scientific information available and based on its ESA consultation above, as well as the foregoing EFH sections, NOAA Fisheries has determined that the proposed actions are likely to adversely affect EFH for Pacific salmon.

E. EFH Conservation Recommendation

Implementation measures included in the joint RMP (Makah 2000) are applicable to designated salmon EFH. Therefore, NOAA Fisheries recommends that those same implementation measures be adopted as the EFH Conservation Recommendation for this consultation.

F. Statutory Response Requirement

Section 305(b)(4)(B) of the ESA and implementing regulations at 50 CFR section 600.920 require a Federal action agency to provide a detailed, written response to NOAA Fisheries within 30 days after receiving an EFH conservation recommendation. The response must include a description of measures proposed by the agency to avoid, minimize, mitigate or offset the impact of the activity on EFH. If the response is inconsistent with a conservation recommendation from NOAA Fisheries, the agency must explain its reasons for not following the recommendation.

G. Consultation Renewal

The BIA and NOAA Fisheries must reinitiate EFH consultation if plans for the action are substantially revised in a way that may adversely affect EFH, or if new information becomes available that affects the basis for the EFH conservation recommendations (50 CFR Section 600.920(k)).

XI. References

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Appendix A. Estimated annual listed sockeye salmon take levels for the Ozette Lake sockeye salmon Resource Management Plan.

Listed species affected: Ozette Lake Sockeye Salmon **Activity: Broodstock Collection, research, and monitoring and evaluation**

Location of hatchery activity: Ozette Lake, Ozette River and lake tributaries **Dates of activity: Year Round**

Type of Take	Annual Take of Listed Fish By Life Stage *(Number of Fish)*			
	Egg/Fry	Juvenile/Smolt	Adult	Carcass
Observe or harass a)	0	0	0	0
Collect for transport b)	0	0	0	0
Capture, handle, and release c)	23,000	0	0	0
Capture, handle, tag/mark/tissue sample, and release d)	0	10,000	0	200
Removal (e.g. broodstock) e)	0	0	210	0
Intentional lethal take f)	0	0	0	0
Unintentional lethal take g)	320	150	10	0
Other Take (any not identified above)	0	0	0	0

a. Contact with listed fish through stream surveys, carcass and mark recovery projects, or migrational delay at weirs.b. Take associated with weir or trapping operations where listed fish are captured and transported for release.

c. Take associated with weir or trapping operations where listed fish are captured handled and released upstream or downstream. Figure includes 10,000 naturally produced tributary-origin fry, up to 12,000 eyed eggs produced from 10 adult sockeye collected on beaches for beach spawning survival research, and 1,000 fry captured in predation research.

d. Take occurring due to tagging and/or bio-sampling of fish collected through trapping operations prior to upstream or downstream release, or through carcass recovery programs. Figure includes 10,000 juvenile sockeye salmon captured through operation of the Ozette River inclined plane trap.

e. Listed and unlisted fish removed from the wild and collected for use as broodstock. Figure includes 10 listed sockeye removed from beach-spawning areas and 200 hatchery (unlisted) or natural-origin (listed) tributary-origin sockeye salmon adults.

f. Intentional mortality of listed fish, usually as a result of spawning as broodstock. Broodstock spawning level included in above row reporting "Removal".

g. Unintentional mortality of listed and unlisted fish. Figure includes 10 adult sockeye killed during capture and tagging for predation and lake survival research, 20 fry killed during lake predation research, 300 tributary-origin fry killed during tributary productivity research, and 150 smolts killed during Ozette River out-migrant trapping.